## ABSTRACT

A novel analytical method involves labeling samples with different radioactive labeling agents, mixing and subjecting the mixture to any separation technique, and then differentially detecting and quantifying subcomponents from each sample for comparison. The novel technique exploits the differences in radiation energy or half-life between isotopes to make differential detection and quantification of labels possible. Detailed methods for differential detection and quantification are also described as well as the construction and application of hardware and software to enable and enhance such a process.